

*Transmitted Via Facsimile to (571) 273-8300**Atty. Dkt. No.: ML00H02/P-US (22589-4)*  
**PATENT****Remarks**

Claims 1-13 and 31-37 are pending in the application. Claims 1-13 and 31-37 are rejected. No new matter has been added. It is respectfully submitted that the pending claims define allowable subject matter.

In accordance with 37 C.F.R. 1.136(a), a two-month extension of time is submitted herewith to extend the due date of the response to the Office Action dated December 13, 2005 for the above-identified patent application from March 13, 2006, through and including May 15, 2006 (May 13<sup>th</sup> was a Saturday). In accordance with 37 C.F.R. 1.17(a)(2), authorization to charge a deposit account in the amount of \$450.00 to cover this extension of time request also is submitted herewith.

Claims 1, 3-6, 8-13, 31, 33, 34, 36 and 37 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Korte (*High-throughput replica optics*, Applied Optics, Vol. 27, No. 8) in view of Pichel (U.S. Patent 3,428,533) or Jochim (U.S. Patent 3,378,469). Applicants respectfully traverse this rejection.

Korte describes different methods for forming optics including an electroforming-type replication technique for the production of x-ray optics (page 1442, column 1). The process includes coating a mandrel surface with a conductive separation layer that is either chemically applied or evaporated onto the surface of the mandrel. An electroforming process is then performed in a controlled bath wherein a layer of nickel is formed on the conductive separation layer. It was then noted that nickel shells with a thickness between 5 and 12 mm were produced. However, the large mass and the internal stress in the layer became so high that the glass mandrel was destroyed during the separation process (page 1442, column 2).

Pichel describes a method for manufacturing a metal master for a parabolic mirror. In particular, a plastic sub-master having substantially the same shape and optical accuracy as a glass master is formed (column 3, lines 33-36). The plastic layer 13 is rigidized with a member 14 by means of epoxy or other adhesive 15 and glass master 10 removed (column 3, lines 42-54). A replica metal master from the plastic sub-master is then

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prepared by immersing the sub-master in an electroplating bath (column 3, lines 59-63). The optical surface of the sub-master is sensitized or rendered electrically conducting by coating it with a thin film or layer of metal, such as silver, which is deposited on the optical surface of the plastic sub-master (column 3, lines 64-75).

Next, employing necessary control to ensure uniform stress-free deposition, a layer of nickel 17 is electroplated over silver layer 16 (column 4, lines 6-11). Proper circulation and temperature maintenance of the electroplating solution, uniform rotation of the sub-master cathode, maintaining a uniform composition or strength of the electroplating solution, etc., are provided and which contribute to the deposition of a nickel layer of uniform thickness that is relatively stress free (column 4, lines 11-17). A backing or rigidizing structure 18 is mounted over the nickel layer, and with the rigidizing structure 18 firmly on nickel layer 17, the replica master structure separated from the plastic sub-master (column 4, lines 21-40). Then, the silver layer is chemically stripped from the nickel layer in such a manner that the optical surface of the replica master, which is the common surface between the silver and nickel layers, is not degraded (column 4, lines 45-49).

Jochim describes a similar method for fabricating an electroformed parabolic mirror using a parabolically-shaped glass master with the addition of removing the sub-master from the bath to apply a mesh structure that will become a rigid backing structure to support the nickel layer (column 4, lines 13-18). Thus, following the removal of the sub-master, a mesh backing structure 18 is mounted over nickel layer 17 (column 4, lines 18-20).

Claim 1, as amended, recites a method of manufacturing a telescope mirror comprising "releasing the mirror body (25) with the reflective layer (26) from the mandrel (10), the mirror body (25) and reflective layer (26) forming a self-supported telescope mirror with the mandrel (10) remaining unchanged." The combination of Korte with either Pichel or Jochim fails to describe or suggest such a method.

The Office Action states that Korte describes a mirror body and reflective layer that forms a "self-supported telescope mirror due to the fact that the mirror has a thickness between 5 and 12 mm." However, Korte describes that forming optics with a thickness between 5 and 12 mm destroys the mandrel during the manufacturing and release

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process. In order to address this issue, reinforcement layers formed from epoxies are used (page 1443, column 1). Thus, self-supported mirrors destroy the mandrel forming the optic. Accordingly, the mandrel does not remain unchanged after releasing the mirror body and reflective layer from the mandrel as recited in amended claim 1. In contrast, Korte describes mirrors that destroy the mandrel during the manufacturing process, otherwise, a supporting layer (i.e., epoxy reinforcement layer) must be provided. Thus, a self-supported telescope mirror formed from a mandrel that remains unchanged is not described or suggested in Korte. Pichel and Jochim describe various methods for electroforming and fail to make up for the deficiencies of the Korte reference. Thus, the combination of Korte with either Pichel or Jochim does not describe or suggest a method as recited in claim 1.

Claims 3-6 and 8-13 depend from independent claim 1. When the recitations of claims 3-6 and 8-13 are considered in combination with the recitations of claim 1, Applicants submit that claims 3-6 and 8-13 are likewise patentable over Korte in combination with Pichel or Jochim for at least the same reasons set forth above.

Claim 31, as amended, recites a method of manufacturing a telescoping mirror comprising “releasing the mirror body (25) with the reflective layer (26) from the mandrel (10) without a supporting structure” and “reusing the mandrel (10).” The combination of Korte with either Pichel or Jochim fails to describe or suggest such a method.

As described and discussed in more detail above in connection with claim 1 when forming an optic that does not include a supporting structure, the mandrel used to form the optic is destroyed. Accordingly, the mandrel cannot be reused as recited in claim 31 because the mandrel is destroyed. Thus, the combination of Korte with either Pichel or Jochim does not describe or suggest a method as recited in claim 31.

Claim 33 depends from independent claim 31. When the recitations of claim 33 are considered in combination with the recitations of claim 31, Applicants submit that claim 33 is likewise patentable over Korte in combination with Pichel or Jochim for at least the same reasons set forth above.

Claim 34, as amended, recites a method of manufacturing a telescoping mirror comprising “releasing the mirror body (25) with the reflective layer (26) from the mandrel

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(10) without a supporting structure such that the mandrel (10) remains unchanged." The combination of Korte with either Pichel or Jochim fails to describe or suggest such a method.

As described and discussed in more detail above in connection with claim 1 when forming an optic that does not include a supporting structure, the mandrel used to form the optic is destroyed. Accordingly, the mandrel does not remain unchanged as recited in claim 34 because the mandrel is destroyed. Thus, the combination of Korte with either Pichel or Jochim does not describe or suggest a method as recited in claim 34.

Claims 36 and 37 depend from independent claim 34. When the recitations of claims 36 and 37 are considered in combination with the recitations of claim 34, Applicants submit that claims 36 and 37 are likewise patentable over Korte in combination with Pichel or Jochim for at least the same reasons set forth above.

Claims 2, 32 and 35 have been rejected under 35 USC § 103(a) as being unpatentable over Korte in view of Pichel or Jochim, and further in view of George et al. (U.S. Patent 4,648,944) or Vaaler (U.S. Patent 4,786,376). Applicants respectfully traverse this rejection.

Korte, Pichel and Jochim are described and discussed in more detail above. George et al. and Vaaler describe devices or gauges for measuring and monitoring internal stress during electroforming and/or electroplating processes.

Claims 2, 32 and 35 recite "wherein the internal mechanical tension is measured during the electroforming process using an additional electroforming sample (18) which is electroformed in parallel or an electronic stress measurement device." Applicants submit that even from a cursory review of George et al. or Vaaler, these references fail to make up for the deficiencies of Korte, Pichel or Jochim in failing to teach or suggest a method as recited in claims 1, 31 and 34. Thus, because claims 2, 32 and 35 depend from independent claims 1, 31 and 34, respectively, when the recitations of claims 2, 32 and 35 are considered in combination with the recitations of claim 1, 31 and 34, respectively, Applicants submit that claims 2, 32 and 35 are likewise patentable over the combination of Korte, Pichel and Jochim with George et al. or Vaaler for at least the reasons set forth above.

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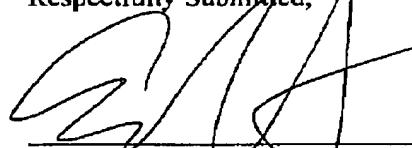
Claim 7 is rejected under 35 USC § 103(a) as being unpatentable over Korte in view of Pichel or Jochim, and further in view of Engelhaupt et al. (U.S. Patent 6,406,611). Applicants respectfully traverse this rejection.

Korte, Pichel and Jochim are described and discussed in more detail above. Applicants submit that even from a cursory review of Engelhaupt et al., this reference fails to make up for the deficiencies of the Korte, Pichel or Jochim references in failing to teach or suggest a method as recited in claim 1. Thus, because claim 7 depends from independent claims 1, when the recitations of claim 7 are considered in combination with the recitations of claim 1, Applicants submit that this claim 7 is likewise patentable over the combination of Korte, Pichel and Jochim with Engelhaupt et al. for at least the reasons set forth above.

Thus, Applicants respectfully request the rejections of claims 1-13 and 31-37 under 35 U.S.C. §103(a) be withdrawn.

In view of the foregoing amendments and remarks, it is respectfully submitted that the prior art fails to teach or suggest the claimed invention and all of the pending claims in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited. Should anything remain in order to place the present application in condition for allowance, the Examiner is kindly invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,



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